

17

configured to come into rolling contact with the flexible rod when the flexible rod passes therethrough.

10. The support equipment of claim 9, wherein the rigid main rod extending from the head portion to the first extension portion and being reciprocally actuated by a motor in a lengthwise direction, and the flexible rod at the connection portion having one end portion and another end portion each respectively connected to the rigid actuation rod and the rigid main rod, the flexible rod being reciprocally actuated by the rigid main rod, performing a rigid motion in a lengthwise direction, and being capable of bending.

11. The support equipment of claim 10, wherein the plurality of guides includes a first guide at least one side of an inner portion and an outer portion of the flexible rod in a bending direction, the plurality of guides being configured to guide the flexible rod.

12. The support equipment of claim 11, wherein the first guide is a roller-type guide, and the first guide is supported on the connection portion and rotating in rolling contact with the flexible rod.

13. The support equipment of claim 9, wherein the elbow joint portion is rolling actuated.

14. The support equipment of claim 9, wherein the elbow joint portion comprises:

a first arm connected to the connection portion, a second arm connected to the first arm via a pitching shaft, the second arm configured to pivot around the pitching shaft, the second arm being bending actuated with respect to the first arm, and a joint link having one end portion connected to the second arm at a position spaced apart from the pitching shaft of the first arm and other end portion connected to the rigid actuation rod connected.

15. The support equipment of claim 9, wherein the first extension portion is connected to a side surface of the head portion facing a movement center axis of the movable member.

16. The support equipment of claim 15, wherein the first extension portion extends from the head portion toward the movement center axis.

17. The support equipment of claim 9, comprising: a pivot member having the surgical instrument installed thereon, the pivot member being installed on the movable member and configured to pivot around a pivot axis that passes through the insertion area, wherein, a movement center axis of the movable member, the pivot axis, and an extension axis of the second extension portion have a single cross point that does not change even when the movable member is moved.

18. The support equipment of claim 17, wherein, the movable member includes a first movable member and a second movable member that move around a respective one of a first movement center axis and a second movement center axis,

the pivot member includes a first pivot member and a second pivot member, on which a first surgical instrument and a second surgical instrument are installed, which are respectively installed on the first movable

18

member and a second movable member, the first pivot member and the second pivot member are configured to pivot around a respective one of a first pivot axis and a second pivot axis,

the first movement center axis, the first pivot axis, and a first extension axis of the first surgical instrument cross at a first cross point, and

the second movement center axis, the second pivot axis, and a second extension axis of the second surgical instrument cross at a second cross point.

19. The support equipment of claim 17, further comprising:

an installation portion having the surgical instrument installed thereon, and the installation portion is supported on the pivot member to be capable of elevating in a direction along the extension axis.

20. A surgical robot system comprising:

at least one support equipment including,

a surgical instrument,

a base member having an insertion area, and

at least one movable member supporting the surgical instrument and installed on the base member to be capable of moving around the insertion area;

a position adjustment unit configured to support the support equipment and move the support equipment to be located at an incision portion of a testee; and

a control station configured to control the surgical instrument, the at least one support equipment, and the position adjustment unit, for a surgical operation, wherein the surgical instrument includes,

an extension portion having a surgical tool at an end thereof,

a head portion connected to the extension portion, the head portion configured to generate a reciprocating force, and

a plurality of rods linearly connected from the head portion to the extension portion, the plurality of rods including at least a rigid main rod and a rigid actuation rod connected via a flexible rod such that the rigid main rod is configured to transfer the reciprocating force from the rigid main rod to the rigid actuation rod via the flexible rod; and

the extension portion includes,

a first extension portion connected to the head portion and having at least a portion of the rigid main rod passing therethrough,

a second extension portion having an elbow joint portion that is bending-actuated by the rigid actuation rod that is reciprocated in a lengthwise direction by the head portion, and

a connection portion connecting the first extension portion and the second extension portion, the connection portion having the flexible rod passing therethrough from the rigid main rod to the rigid actuation rod at an angle, the connection portion having a plurality of guides therein such that the plurality of guides are configured to come into rolling contact with the flexible rod when the flexible rod passes therethrough.

\* \* \* \* \*